

## **Appendix: supporting information**

Short term estimates of adult HIV incidence by mode of transmission: Kenya and Thailand as examples

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Data points used in the spreadsheets to estimate HIV incidence among adults by mode of exposure are shown in figure 1 for Kenya and in figure 2 for Thailand.

Data sources specific for each country and changes made to the model are detailed below.

### **Kenya**

- The base transmission rate was changed to 0.0011 based on data from Rakai.<sup>1</sup>
- The base transmission rate from female to male was modified by the percentage of men circumcised assuming a 60% reduction for men who are circumcised.<sup>2</sup>
- Behavioural data were mainly obtained from the 2003 Kenya Demographic and Health Survey.<sup>3</sup>
- Information on number of partners and acts per partner for sex work were obtained from the University of Nairobi Hotspot Mapping Project.<sup>4</sup>
- Number of medical injections per person per year and safety of medical injections were obtained from a review by Hutin *et al.*<sup>5</sup>
- Number of blood transfusions per year and safety of blood transfusions were obtained from a WHO review.<sup>6</sup>

### **Thailand**

- Default transmission probabilities were used in the estimation process.
- Most data points are based on information from 2004 Thailand surveillance (also used in other software including the UNAIDS Workbook model) and calibrated using the Asian Epidemic Model.<sup>7</sup>
- Number of medical injections per person per year and safety of medical injections were obtained from a review by Hutin *et al.*<sup>5</sup>
- Number of blood transfusions per year and safety of blood transfusions were obtained from a WHO review.<sup>6</sup>

(1) Kenya: data points used in the spreadsheet for estimating number of new infections by mode of transmission

Adult Risk Behaviour	Number with risk behaviour	Prevalence of HIV	Number HIV+	Prevalence of STI	Number of partner s per year	Number of acts of exposure per partner per year	Percentage of acts protected	Transmission probability per risky exposure act		Incidence	% of incidence	Incidence per 100,000
								with STI	No STI			
Injecting Drug Use (IDU)	24,537	20.0%	4,907	3.5%	5	50	50%	NA	0.01	3,991	4.84	16,263
Partners IDU	12,269	12.0%	1,472	NA	1	70	7%	0.0055	0.0011	167	0.20	1,360
Sex workers	53,164	40.0%	21,265	65.0%	163	4	65%	0.0055	0.0011	1,032	1.25	1,942
Clients	237,191	8.1%	19,212	15.0%	16	9	65%	0.0027	0.0005	8,629	10.48	3,638
Partners of Clients	118,596	9.0%	10,674	NA	1	70	7%	0.0055	0.0011	909	1.10	767
MSM	81,790	20.0%	16,358	15.0%	3	10	35%	0.0500	0.0100	3,697	4.49	4,521
Female partners of MSM	40,895	15.0%	6,134	NA	1	50	7%	0.0055	0.0011	531	0.64	1,298
Casual heterosexual sex	3,214,200	13.1%	420,377	7.0%	2	35	35%	0.0036	0.0007	15,079	18.31	469
Partners CHS	2,571,360	6.5%	168,151	NA	1	70	7%	0.0046	0.0009	22,849	27.74	889
Low-risk heterosexual sex	6,073,990	7.5%	455,549	3.5%	1	70	7%	0.0041	0.0008	24,830	30.14	409
No risk	3,930,010	0.0%	-	0.0%	0	0				0	0.00	0
Medical injections	16,358,000	6.7%		NA	2.2	1	80%	NA	0.001	456	0.55	3
Blood transfusions	81,790	6.7%		NA	1	1	96%	NA	0.9	199	0.24	244
<b>TOTAL ADULT POPULATION</b>	<b>16,358,000</b>	<b>6.87%</b>	<b>1,124,100</b>					Total incidence		82,369		504
								Total incidence in partners of high-risk individuals		24,456	29.691	892

(2) Thailand: data points used in the spreadsheet for estimating number of new infections by mode of transmission

	Number with risk behaviour	Prevalence of HIV	Prevalence of STI	Number of partners per year	Number of acts of exposure per partner per year	Percentage of acts protected	Transmission probability per risky exposure act			% of incidence	Incidence per 100,000
Adult Risk Behaviour							with STI	No STI	Incidence		
Injecting Drug Use (IDU)	38,835	45.0%	5.0%	6	15	80%	NA	0.006	1,011	5.68	2,604
Partners IDU	31,068	40.0%	NA	1	14	20%	0.006	0.002	204	1.15	657
Sex workers	147,944	5.0%	2.0%	300	1.1	80%	0.006	0.0015	705	3.96	476
Clients	2,293,130	5.0%	0.5%	24	2	80%	0.003	0.001	1,088	6.11	47
Partners of Clients	617,666	4.0%	NA	1	26	2%	0.006	0.002	1,488	8.35	241
MSM	554,790	7.0%	2.0%	5	10	80%	0.03	0.01	3,724	20.91	671
Female partners of MSM	110,958	2.0%	NA	1	45	40%	0.006	0.002	415	2.33	374
Casual heterosexual sex	1,849,298	2.0%	0.5%	1	15	25%	0.0045	0.0015	613	3.44	33
Partners CHS	554,790	1.5%	NA	1	45	2%	0.0045	0.0015	706	3.97	127
Low-risk heterosexual sex	27,088,894	0.60%	0.0%	1	33.3	2%	0.0045	0.0015	7,724	43.36	29
No risk	3,698,597	0.0%	0.0%	0	0				0	0.00	0
Medical injections	36,985,969	0.05%	NA	2	1	70%	NA	0.001	133	0.75	0
Blood transfusions	184,930	0.05%	NA	1	1	100%	NA	0.9	0	0.00	0
TOTAL ADULT POPULATION	36,985,969	1.15%					Total incidence		17,811		48
	36,985,969				Total incidence in partners of high-risk individuals				2,814	15.799	214

## References

- 1 Gray RH, Wawer MJ, Brookmeyer R, *et al.* Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1 discordant couples in Rakai, Uganda. *Lancet* 2001;**357**:1149–53.
- 2 Gray RH, Kiwnuka NC, Quinn TC, *et al.* Male circumcision and HIV acquisition and transmission: cohort studies in Rakai, Uganda. *AIDS* 2000;**14**:2371–81.
- 3 Central Bureau of Statistics (CBS) [Kenya], Ministry of Health (MOH) [Kenya], and ORC Macro. 2004. *Kenya Demographic and Health Survey*. Calverton, Maryland: CBS, MOH, and ORC Macro.
- 4 Kenya Hotspot Mapping Project, description available at <http://www.futuresgroup.com/SuccessStory.cfm?area=7> (accessed April 2006).
- 5 Hutin YJF, Hauri AM, Armstrong GL. Use of injections in healthcare settings worldwide, 2000: literature review and regional estimates. *BMJ* 2003;**327**:1075.
- 6 Rapiti E, Hutin Y, Dhingra N. The global burden of HBV, HCV and HIV infections attributable to unsafe blood transfusions. WHO (unpublished report).
- 7 Integrated Analysis and Advocacy (A<sup>2</sup> Thailand). Preliminary results of HIV/AIDS projection 2005-2025. HIV/AIDS Projection meeting Dec 2005. Ministry of Public Health, Nonthaburi, Thailand